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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,444	12/19/2003	Maurice Milgram	1948-4830	7680
27123	7590	10/05/2007	EXAMINER	
MORGAN & FINNEGANT, L.L.P. 3 WORLD FINANCIAL CENTER NEW YORK, NY 10281-2101			WANG, CLAIRE X	
		ART UNIT		PAPER NUMBER
		2624		
		NOTIFICATION DATE	DELIVERY MODE	
		10/05/2007	ELECTRONIC	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/743,444	MILGRAM ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Claire Wang	2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 10 July 2007.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-30 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-30 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date: _____   | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

***Response to Amendment***

1. Applicants' response to the last Office Action, filed on July 10<sup>th</sup>, 2007 has been entered and made of record.
  
2. In view of the Applicant's arguments and amendments, the objection of claim 11 and the rejections under 35 U.S.C. 112 rejection (claims 1 and 3) are expressly withdrawn.

***Response to Arguments***

3. Applicant's arguments filed July 10<sup>th</sup>, 2007 have been fully considered but they are not persuasive.

a. In response to applicant's argument that "there is no analysis by Nichani of light decrease gradient to determine an image of the road edges. It is noted that Nichani teaches an intensity gradient that may be represented with an image gradient angle (Col. 3, lines 18-19). The intensity gradient reads on the claimed light gradient.

b. In response to applicant's argument that "nothing in Yasui's disclosure, however, suggests that the distribution of luminous pixels of the road edges can be used instead." It is noted that Yasui teaches obtaining edge intensity using a Sobel filter (Col. 5, lines 22-23). It is well known in the art that a Sobel filter uses luminosity to detect the edge. It is also noted that Yasui teaches obtaining a curve based on the edge intensity (S10 Fig. 4). Since Yasui teaches a lane detection sensor it is noted the curve obtained is the curve of a lane or the road.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-30 are rejected under second paragraph of 35 U.S.C. 112.

As to Claim 1 recites the limitation "the distribution of luminosity" in line 10.

There is insufficient antecedent basis for this limitation in the claim.

As to claims 2-30, they are rejected because they are dependents of claim 1.

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nichani (US 6,819,779) in view of Yasui et al. (US 5,922,036 hereinafter "Yasui").

As to claim 1, Nichani teaches a method of detecting from a vehicle variations in path on a road having a surface and road edges (road lane detection system; Col. 1, line 8) comprising the steps of, taking an image of a road scene unfolding in front of the vehicle (Fig. 1 shows the top view of a car with a camera (12) mounted on top) and at least partly illuminated by the vehicle (Fig. 1 also shows that due to the placement of the camera the image captured will be illuminated by the vehicle's headlights); determining for each pixel in the image a light decrease gradient (edge processor uses Sobel Edge detection which is a way of finding the gradient of the image; Col. 5, lines 35-41); analyzing these light decrease gradients and determining an image of the road edges (true peak detection; Col. 5, line 42); mathematically discrimination a gradient from the image of the road edges (lane marker detector component distinguishes between other edges of the image and the actual lane markers; Col. 5, lines 50-56). However, Nichani

does not teach analyzing this discrimination and determining an angle of a bend of the road.

Yasui teaches a lane detection system that calculates a radius of a curvature of a road ahead of a running vehicle and the curve is found using an angle formed between the two tangents (Col. 2, lines 32-41). Thus Yasui's teachings of finding the radius using an angle formed between two tangents read on the claimed determining an angle of the bend. Therefore, it would have been obvious for one ordinarily skilled in the art at the time of the invention to combine Nichani's road lane detection system with Yasui's method of finding the radius using an angle of tangents in order to obtain an accurate curvature of the road (Yasui Col. 2, lines 39-40).

As to claim 2, Nichani teaches wherein the gradient of an elementary image part corresponds to a decrease vector of light formed between adjacent pixels (each pixel within the image is represented in grayscale, the edge detection is calculating the gradient between the pixels by selecting significant gradient magnitude and the gradient angle is the direction of the gradient (Col. 5, lines 29-34); thus the above forms the definition of a vector by having both magnitude and direction).

As to claim 3, Nichani teaches wherein the analysis of the light decrease gradients comprises a thresholding of the decrease vectors and an elimination of the decrease vectors outside the threshold (the feature edges that corresponds to a pair of land markers edges subject to a threshold width of a lane marker; Col. 5, lines 50-56).

As to claim 29, Yasui teaches wherein the step of mathematically discriminating comprises generating a first curve corresponding to the number of pixels having decrease vector oriented from the left of the image towards the center of the image, and generating a second curve corresponding to the number of pixel having a decrease vector oriented from the left of the image towards the center of the image (Col. 6, lines 28-44).

As to claim 30, Yasui teaches wherein the step of analyzing the discrimination comprises deducting the shape of the road ahead based on the form of the first and second curves (Fig. 6).

3. Claims 4-5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nichani in view of Yasui applied to claims 1-3 above, and further in view of Kuwano et al. (US 6,501,856 hereinafter "Kuwano")

As to claim 4, Nichani and Yasui do not teach wherein the mathematical discrimination comprises counting the elementary image parts having a vector oriented in one direction and the elementary image parts have a decrease vector oriented in the opposite direction. Kuwano teaches scanning an image and calculating the edge pairs of the image and counting them and putting them in a table format (Fig. 23). The edge pairs are vectors going in opposite directions. Thus Kuwano's edge pair technique reads on the claimed counting of vectors going in different directions. Therefore, it would have been obvious for one ordinarily skilled in the art at the time of the invention to combine Nichani and Yasui's road lane detection system with Kuwano's edge detection image processing method in order to better extract edges.

As to claim 5, Kuwano teaches wherein the counting of the elementary image parts is carried out pixel column by pixel column, or by groups of pixel columns (Fig. 22 shows that edge pairs may be found in vertical or horizontal directions).

As to claim 11, it is the same as claim 4. Please see claim 4 for detail analysis.

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4. Claims 6-9 and 12-13, 16-18; 21-22 and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nichani in view of Yasui applied to claims 1-3 above, and further in view of Stam et al. (US 2003/0123706 hereinafter "Stam").

As to claim 6, Nichani and Yasui do not teach wherein the analysis of the discrimination is carried out by a neural network. Stam teaches decision rules may be implemented using a neural network (Paragraph [0211] lines 19-21). Thus Stam's neural network for controlling vehicle lights reads on the claimed neural network. Therefore, it would have been obvious for one ordinarily skilled in the art at the time of the invention to combine Nichani and Yasui's road lane detection system with Stam's neural network in order to have a more automated system.

As to claim 7, Stam teaches the control of the a vehicle light using neural network but does not teach wherein the neural network has previously learnt geometries of bends and corresponding mathematical discriminations. However, it is obvious to substitute the conditions that a neural network can learn.

As to claim 8, Nichani and Yasui teach a camera mounted in the vehicle (Fig. 1), an image-processing unit (Nichani 74, Fig. 2) but does not teach of a neural network. Stam teaches a system for controlling exterior vehicle lights using a neural network ([0211]). Thus Stam's neural network for controlling vehicle lights reads on the claimed neural network. Therefore, it would have been obvious for one ordinarily skilled in the

art at the time of the invention to combine Nichani and Yasui's road lane detection system with Stam's neural network in order to have a more automated system.

As to claim 9, Stam teaches wherein the neural network is integrated in the image-processing unit (image processing routine, [0211] line 4; decision rules may be implemented using a neural network, [0211] lines 19-21).

As to claims 12-13, they are the same as claim 6. Please see above for detail analysis.

As to claims 16-18, they are the same as claim 7. Please see above for detail analysis.

As to claims 21-22 and 25-26, they are the same as claim 8. Please see above for detail analysis.

5. Claims 14-15, 19-20, and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nichani in view of Yasui and Kuwano as applied to claims 4, 5 and 11 above, and further in view of Stam.

As to claim 14, Nichani, Yasui and Kuwano do not teach wherein the analysis of the discrimination is carried out by a neural network. Stam teaches decision rules may be implemented using a neural network (Paragraph [0211] lines 19-21). Thus Stam's neural network for controlling vehicle lights reads on the claimed neural network.

Therefore, it would have been obvious for one ordinarily skilled in the art at the time of the invention to combine Nichani and Yasui's road lane detection system with Stam's neural network in order to have a more automated system.

As to claim 15, it is the same as claim 14. Please see above for details.

As to claim 19, Stam teaches the control of the a vehicle light using neural network but does not teach wherein the neural network has previously learnt geometries of bends and corresponding mathematical discriminations. However, it is obvious to substitute the conditions that a neural network can learn.

As to claim 20, it is the same as claim 19. Please see above for details.

As to claim 23, Nichani, Yasui and Kuwano teach a camera mounted in the vehicle (Fig. 1), an image-processing unit (Nichani 74, Fig. 2) but does not teach of a neural network. Stam teaches a system for controlling exterior vehicle lights using a neural network ([0211]). Thus Stam's neural network for controlling vehicle lights reads on the claimed neural network. Therefore, it would have been obvious for one ordinarily skilled in the art at the time of the invention to combine Nichani and Yasui's road lane detection system with Stam's neural network in order to have a more automated system.

As to claim 24, it is the same as claim 23. Please see above for details.

6. Claims 10 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nichani in view of Yasui and Stam applied to claims 6-9 and 12-20 above, and further in view of Liao (US 5,550,717).

As to claim 10, Nichani, Yasui and Stam does not teach bend detecting system is connected to a vehicle headlight, movable or fixed and modulated for intensity. Liao teaches a direction turning device for a vehicle headlight, wherein the headlight turns in the direction of the car turn (Col. 1, lines 27-32). Therefore, Liao's turning headlight reads on the claimed movable headlight. Therefore, it would have been obvious for one ordinarily skilled in the art at the time of the invention to combine Nichani, Yasui and Stam's road lane detection system with a tunable vehicle headlight in order to increase the illuminated area upon changes of direction of the automobile (Liao Col. 1, lines 30-32).

As to claim 27, it is the same as claim 10. Please see above for detail analysis.

7. Claim \*\*\* rejected under 35 U.S.C. 103(a) as being unpatentable over Nichani in view of Yasui as applied to claims 1-3 above, and further in view of Liao.

As to claim 28, Nichani and Yasui teach determining the angle of the road (Yasui Fig. 4), however, they do not teach controlling lateral orientation of at least one vehicle headlight. Liao teaches a direction turning device for a vehicle headlight, wherein the headlight turns in the direction of the car turn (Col. 1, lines 27-32). Therefore, Liao's turning headlight reads on the claimed movable headlight. Therefore, it would have been obvious for one ordinarily skilled in the art at the time of the invention to combine Nichani and Yasui's road angle determination system with a tunable vehicle headlight in order to increase the illuminated area upon changes of direction of the automobile (Liao Col. 1, lines 30-32).

***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Contact Information***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Claire Wang whose telephone number is 571-270-1051. The examiner can normally be reached on Mid-day flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on 571-272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Claire Wang  
09/28/2007

SAMIR AHMED  
PRIMARY EXAMINER